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Notes:

1. Untranslatable words are replaced with asterisks (***).
2. Texts in the figures are not translated and shown as it is.

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Dictionary: Last updated 09/12/2008 / Priority: 1. Mechanical engineering / 2. Chemistry

FULL CONTENTS

[Claim(s)]

[Claim 1] a cooling room and warming -- being the heat insulation and the heat retaining device which generates the cold supplied to a room, respectively, and warmth by one line, and carrying out heat exchange of the open air to air -- warming -- [means / to generate the warmth sent into a room / warmth formation] The heat insulation and the heat retaining device characterized by having a cold formation means to generate the cold which is made to carry out adiabatic expansion of said air, and is sent into a cooling room.

[Claim 2] In heat insulation and a heat retaining device according to claim 1, [said warmth formation means] [the air] while carrying out heat exchange of the compressor which generates the air of elevated-temperature high voltage, the intake-air object which incorporates the open air, and the air of elevated-temperature high voltage from a compressor to the open air incorporated with said intake-air object They are the heat insulation and the heat retaining device which is equipped with the heat exchanger supplied to a cold formation means, and is characterized by said cold formation means consisting of an expansion turbine.

[Claim 3] They are the heat insulation and the heat retaining device characterized by for said compressor and said expansion turbine sharing a revolving shaft in heat insulation and a heat retaining device according to claim 2, and unifying.

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the heat insulation and the heat retaining device which performs both heat and cooling.

[0002]

[Description of the Prior Art] For example, if it is in automatic vending machines, such as can

juice, both cold potable water and warm potable water are prepared. as such an automatic vending machine -- drawing 5 -- like -- warming -- it is classified into the room 1 and the cooling room 2, and is shown in the machine house 3 established in the lower part of them 1 and 2 at drawing 6 -- as -- warming -- it has the heating system 4 for heating a room 1, and the cooling system 5 for cooling a cooling room 2.

[0003] energizing the heating system 4 at a heater -- warming -- it is heating a room 1 and goods 9 are warmed. The cooling system 5 uses as a refrigerant the chlorofluocarbon enclosed with the core, carries out adiabatic expansion by being decompressed by the decompression means which is not illustrated, after this radiates for it heat and liquefies the heat of condensation by adiabatic compression being carried out, becoming high voltage, and subsequently to a condenser 7 reaching with a compressor 6, and serves as low temperature low pressure. And the refrigerant of low temperature low pressure results in an evaporator 8 further, a cooling wind is generated by taking evaporation heat, and goods are cooled by this being sent into a cooling room 2. On the other hand, the refrigerant cooled with the evaporator 8 returns to a compressor 6, and the same cycle is repeated hereafter.

[0004]

[Problem to be solved by the invention] by the way -- since it has two lines of the cooling system 5 and the heating system 4 in the automatic vending machine shown above -- warming -- the tooth space of a room 1 and a cooling room 2 received constraint, and there was a problem to which storage space becomes small. Especially the cooling system 5 needed the decompression means besides a compressor 6, a condenser 7, and an evaporator 8, Line 5a, etc., and there were many architecture mark, and it was difficult to make small the establishment tooth space of a machine house 3. Moreover, when the cooling system 5 and the heating system 4 were formed independently, respectively, electric power was consumed so much and there was a problem on which running cost soars. And since the cooling system used chlorofluocarbon as a refrigerant, it was not desirable from the environment.

[0005] It is in offering the heat insulation and the heat retaining device which this invention was made in consideration of such a situation, and that object can obtain the performance of the both sides of cooling and heat, and can attain amplification-izing of storage space, and power-saving.

[0006]

[Means for solving problem] In order to attain the above-mentioned object, this invention has proposed the following means. invention concerning Claim 1 -- a cooling room and warming -- being the heat insulation and the heat retaining device which generates the cold supplied to a room, respectively, and warmth by one line, and carrying out heat exchange of the open air to the air of elevated-temperature high voltage -- warming -- [means / to generate the warmth sent into a room / warmth formation] It is characterized by having a cold formation means to

generate the cold which is made to carry out adiabatic expansion of the air of low-temperature high voltage further, and is sent into a cooling room.

[0007] according to the heat insulation and the heat retaining device concerning this invention - warmth -- warming -- since a warmth formation means to supply a room, and a cold formation means to supply cold to a cooling room are constituted from one line warming -- it is lost that the tooth space of a room and a cooling room is restricted, amplification-ization of storage space can be attained, since it is moreover one line, power consumption can be reduced, and cheap-ization of running cost can be attained.

[0008] In heat insulation and a heat retaining device according to claim 1, invention concerning Claim 2 [said warmth formation means] While carrying out heat exchange of the compressor which generates the air of elevated-temperature high voltage, the intake-air object which incorporates the open air, and the air of elevated-temperature high voltage from a compressor to the open air incorporated with said intake-air object, it has the heat exchanger supplied to a cold formation means, and said cold formation means is characterized by consisting of an expansion turbine.

[0009] According to the heat insulation and the heat retaining device concerning this invention, are generable to warmth by heat exchange of the open air being carried out with the air and the heat exchanger of elevated-temperature high voltage from a compressor. Moreover, since cold is generable by the air of elevated-temperature high voltage being led to an expansion turbine through a heat exchanger, the both sides of warmth and cold are exactly generable.

[0010] Invention concerning Claim 3 is characterized by said compressor and said expansion turbine sharing the revolving shaft in heat insulation and a heat retaining device according to claim 2. According to the heat insulation and the heat retaining device concerning this invention, power-saving is also further realizable by supplying not only amplification-izing of storage space but the recovery energy from a dilatation turbine as a part of source of actuation of a compressor by sharing a revolving shaft.

[0011]

[Mode for carrying out the invention] With reference to Drawings, the form of implementation of this invention is explained hereafter. It is drawing showing the automatic vending machine which applied the heat insulation and the heat retaining device which drawing 3 requires for the form of 1 implementation of this invention from drawing 1 , and is the piping diagram showing the heat insulation and the heat retaining device with which drawing 1 and drawing 2 were installed in the front view and side-face sectional view of an automatic vending machine, and drawing 3 was installed in the automatic vending machine. the automatic vending machine 10 of this embodiment -- drawing 1 -- like -- warming -- while a room 11 and a cooling room 12 are formed, a machine house 13 is established in the lower part of them 11 and 12 -- a machine house 13 -- drawing 2 -- like -- warming -- while keeping a room 11 warm, the heat

insulation and the heat retaining device 20 for cooling a cooling room 12 are formed.

[0012] One heat insulation and the heat retaining device 20 become clitteringly like drawing 3 , and is equipped with the suction fan (intake-air object) 21, the compressor 22, the primary heat exchanger 23 as a heat exchange means and the secondary commutator 24, and the expansion turbine 25. and the warmth which was heated by heat exchange of the open air being carried out to the air of elevated-temperature high voltage generated by the compressor 22 in the primary heat exchanger 23 if the open air is incorporated into the primary heat exchanger 23 with the suction fan 21, was generated by warmth, and was generated -- warming -- a room 11 is supplied.

[0013] On the other hand, heat exchange is carried out to the open air because the air of elevated-temperature high voltage from a compressor 22 passes the primary heat exchanger 23. After condensing and being cooled as high-pressure air, it is further cooled by passing the secondary heat exchanger 24, adiabatic expansion is carried out because the cooling air passes the expansion turbine 25, and it is further generated by the cold of a low-temperature atmospheric pressure, and the generated cold is supplied to a cooling room 12.

[0014] The expansion turbine 25 will be cooled by lowering and carrying out adiabatic expansion of the air at a stretch to an atmospheric pressure, if high voltage air is flowed by carrying out a high velocity revolution. In that case, the motor 26 of the compressor 22 is installed in the same axle of the expansion turbine 25. And after the cold discharged from the cooling room 12 is used as an object for the heat exchange of the secondary heat exchanger 24, a compressor 22 is supplied again and heat and cooling are repeated in the same path as the following.

[0015] Therefore, this heat insulation and heat retaining device 20 [with the suction fan 21, a compressor 22, and the primary heat exchanger 23] carrying out heat exchange of the open air to the air of elevated-temperature high voltage -- warming -- [means / to generate the warmth supplied to a room 11 / warmth formation] It has a cold formation means to generate the cold which is made to carry out adiabatic expansion of the air of low-temperature high voltage with the expansion turbine 25, and is supplied to a cooling room 12, and, moreover, these warmth formation means and the cold formation means constitute the closed system made to circulate through air. In addition, in drawing 2 and drawing 3 , a code 27 is the duct piped between the secondary heat exchanger 24 and the expansion turbine 25.

[0016] Since the automatic vending machine 10 of this embodiment is constituted as mentioned above, if it energizes and operates to a motor 26 and the suction fan 21, a compressor 22 will drive by a motor 26 and the air of a high voltage elevated temperature will flow into the primary heat exchanger 23 with this compressor 22. the warmth which the suction fan 21 incorporated the open air into the primary heat exchanger 23, was then generated by warmth by heat exchange of the open air being carried out to the air of elevated-temperature

high voltage from a compressor 22 in the primary heat exchanger 23, and was generated -- the arrow head A of drawing 2 -- like -- warming -- a room 11 is supplied. since temperature up of the open air is carried out to about 70 degrees C by the primary heat exchanger 23 when the air by which the incorporated open air was breathed out from the compressor 22 in room temperature at this time is about 90 degrees C -- warming -- the goods 9, such as a can stored, can be warmed at a room 11.

[0017] On the other hand if heat exchange of the air of elevated-temperature high voltage breathed out from the compressor 22 is carried out to the open air with the primary heat exchanger 23 Only the part serves as high-pressure air at low temperature, if the high-pressure air is sent into the expansion turbine 25 after being further cooled through the secondary commutator 24, cold will be generated because the expansion turbine 25 carries out adiabatic expansion of the air, and the this generated cold will be supplied to a cooling room 12 like the arrow head B of drawing 2 . In this case, since it will be cooled by about -5 degrees C of expansion turbines by 25 if it is cooled to about 50 degrees C because the air from a compressor 22 passes the primary heat exchanger 23, and it falls to around 20 degrees C by the secondary heat exchange 24, the goods stored inside can be cooled in a cooling room 12.

[0018] [with thus, the suction fan 21 of heat insulation and the heat retaining device 20 a compressor 22, and the primary heat exchanger 23] carrying out heat exchange of the open air to the air of elevated-temperature high voltage -- warming -- since the cold which is made to carry out adiabatic expansion of the air of low-temperature high voltage with the expansion turbine 25, and is supplied to a cooling room 12 is generated while generating the warmth supplied to a room 11 warming -- the warmth supplied to a room 11 and the cold supplied to a cooling room 12 are certainly generable by one line.

[0019] Therefore, since the establishment tooth space of a machine house 13 can be made small it becomes unnecessary to install the heating system 4 and the cooling system 5 like the conventional example, respectively -- warming -- while it is lost that the storage space of a room 11 and a cooling room 12 is restricted and being able to attain amplification-ization of storage space Since it warms using the hot exhaust heat in one cooling system, power consumption can be reduced, and cheap-ization of running cost can also be attained.

[0020] And since this heat insulation and heat retaining device 20 keep it warm with heat insulation by the air breathed out from the compressor 22 consisting of closed systems again returned to a compressor 22, and using air as a medium There is not only no possibility of polluting an environment, but since it is not necessary to make it a high pressure like [in the case of chlorofluocarbon], it excels in safety.

[0021] Moreover, since cold is generable by the air of elevated-temperature high voltage being led to the expansion turbine 25 while warmth is generable only by heat exchange of the open

air being carried out with the air and the primary heat exchanger 23 of elevated-temperature high voltage from a compressor 22, the both sides of warmth and cold are exactly generable. Moreover, a compressor 22 and the expansion turbine 25 are installed in the same axle, miniaturization is achieved, and since the power collected from the dilatation turbine is used as a part of source of actuation of a compressor, amplification-izing of storage space and low-electric-power-ization are further realizable also from the point. Furthermore, since the primary heat exchanger 23 and the secondary heat exchanger 24 are formed between a compressor 22 and the expansion turbine 25, heat exchange of the elevated-temperature high voltage air from a compressor 22 is carried out by 2 stage constitution and it sends into the expansion turbine 25, the heat balance of air becomes good and cooling and heat of air can be performed smoothly.

[0022] In addition, although the graphic display embodiment showed the example which applied heat insulation and the heat retaining device 20 to the automatic vending machine 10, as it is not limited to this and shown in drawing 4 , it can carry in a car 14 and can also use as heat insulation and a hot insulation vehicle. In drawing 4 , the same code is given to the same part as drawing 3 from drawing 1 . Therefore, in this invention, it is applying to what performs heat insulation and hot insulation simultaneously, and becomes very useful.

[0023]

[Effect of the Invention] according to invention which relates to Claim 1 as explained above -- warmth -- warming -- since a warmth formation means to supply a room, and a cold formation means to supply cold to a cooling room were constituted from one line, the effectiveness that amplification-ization of storage space can be attained and power-saving can be attained is acquired.

[0024] Since the open air can generate cold by being able to generate to warmth only by carrying out heat exchange of the air of elevated-temperature high voltage from a compressor with a heat exchanger, and leading the air of elevated-temperature high voltage to an expansion turbine according to invention concerning Claim 2, the effectiveness which can generate the both sides of warmth and cold exactly is acquired.

[0025] According to invention concerning Claim 3, since the power which could achieve miniaturization by installing in the same axle, and was collected in the dilatation turbine is used as a part of source of actuation of a compressor, the effectiveness that not only amplification-izing of storage space but power-saving is further realizable is acquired.

[Brief Description of the Drawings]

[Drawing 1] It is the front view showing the automatic vending machine which applied the heat

insulation and the heat retaining device concerning the form of 1 implementation of this invention.

[Drawing 2] Similarly it is the side-face sectional view of drawing 1 .

[Drawing 3] It is the piping diagram showing heat insulation and a heat retaining device.

[Drawing 4] It is the explanatory view showing the car carrying heat insulation and a heat retaining device.

[Drawing 5] It is the front view showing the automatic vending machine which installed the conventional heat insulation and heat retaining device.

[Drawing 6] It is the side-face sectional view of drawing 5 .

[Explanations of letters or numerals]

10 Automatic Vending Machine

11 Warming -- Room

12 Cooling Room

13 Machine House

20 Heat Insulation and Heat Retaining Device

21 Suction Fan (Intake-Air Object)

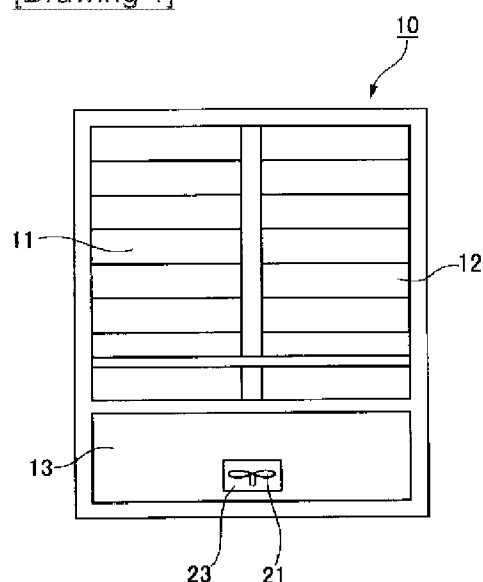
22 Compressor

23 Primary Heat Exchanger

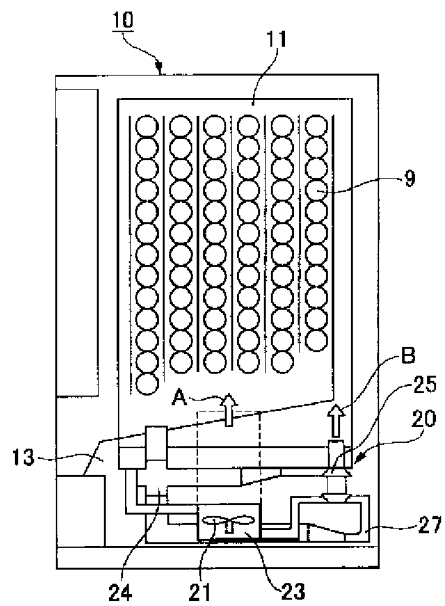
24 Secondary Heat Exchanger

25 Expansion Turbine

[Drawing 1]

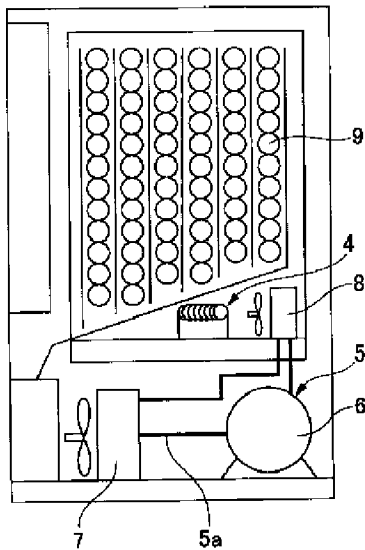


[Drawing 2]

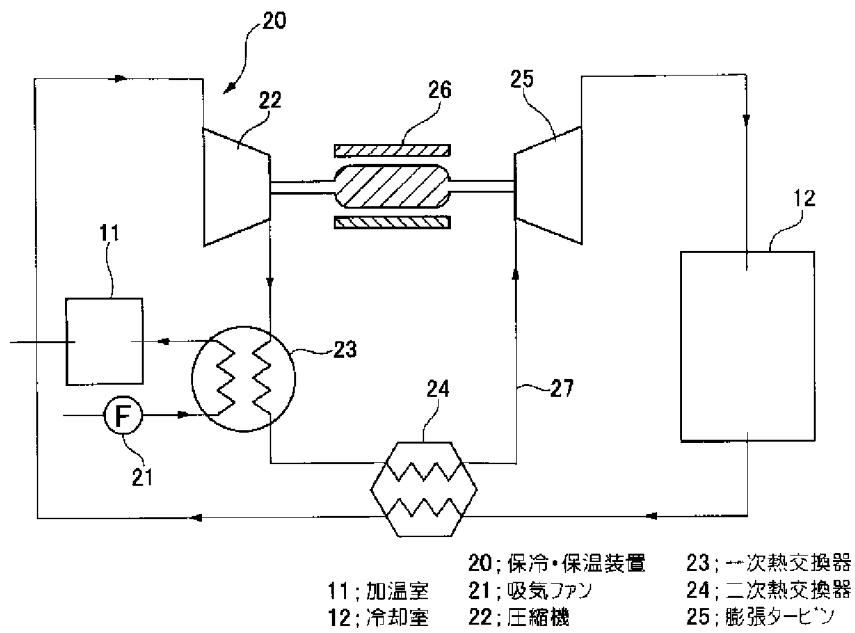


- | | |
|-------------|------------|
| 10; 自動販売機 | 21; 吸気ファン |
| 11; 加温室 | 23; 一次熱交換器 |
| 12; 冷却室 | 24; 二次熱交換器 |
| 13; 機械室 | 25; 膨張タービン |
| 20; 保冷・保温装置 | |

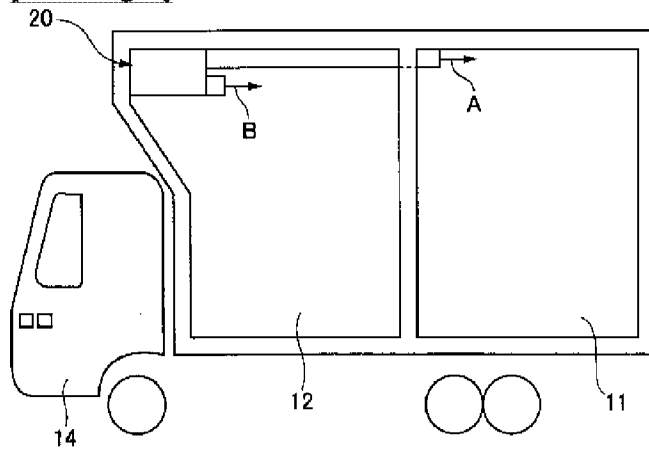
[Drawing 6]



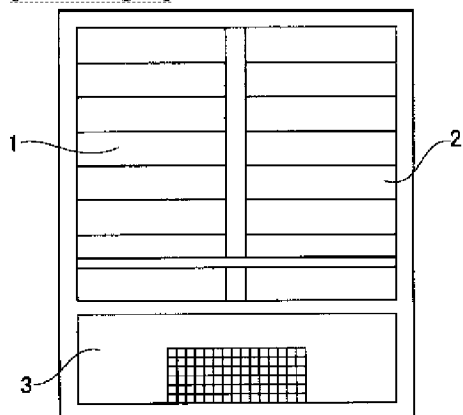
[Drawing 3]



[Drawing 4]



[Drawing 5]



[Translation done.]